

WHAT IS CLAIMED IS:

1           1.       A program storage device readable by a computer tangibly embodying one  
2       or more programs of instructions executable by the computer to perform a method for  
3       dynamically resizing mirrored virtual disks in a RAID storage system, the method  
4       comprising:

5           receiving a request to dynamically resize mirrored virtual disks in a RAID storage  
6       system;

7           manipulating RAID's in the RAID storage system to provide the desired resizing  
8       of the mirrored virtual disk; and

9           providing the resized mirrored virtual disks for operation.

1           2.       The program storage device of claim 1 wherein the request to dynamically  
2       resize mirrored virtual disks in a RAID storage system is a request to dynamically expand  
3       mirrored virtual disks in a RAID storage system, and wherein the manipulating RAID's to  
4       provide the desired resizing further comprises:

5           creating an amount of storage necessary by providing RAID's on each subsystem  
6       that is associated with each component of a mirror set;

7           attaching the RAID's to a specific virtual disk for a mirror device; and

8           specifying a size for the virtual disk and mapping the size of the virtual disk  
9       directly to all components of the mirror set.

1           3.       The program storage device of claim 2 wherein the specifying a size for  
2       the virtual disk and mapping the size of the virtual disk is performed by an operating  
3       system.

1           4.       The program storage device of claim 1 wherein the request to dynamically  
2       resize mirrored virtual disks in a RAID storage system is a request to dynamically shrink  
3       mirrored virtual disks in a RAID storage system, and wherein the manipulating the  
4       RAIDs to provide the desired resizing further comprises:  
5               specifying a size of a virtual disk and mapping the size of the virtual disk directly  
6       to all components of a mirror set;  
7               detaching any RAIDs that extend beyond the specified size of the virtual disk; and  
8               truncating RAIDs to free up any excess physical segments back into the RAID  
9       storage system.

1           5.       The program storage device of claim 4 wherein the specifying a size for  
2       the virtual disk and mapping the size of the virtual disk is performed by an operating  
3       system.

1           6.       A program storage device readable by a computer tangibly embodying one  
2       or more programs of instructions executable by the computer to perform a method for  
3       dynamically expanding mirrored virtual disks in a RAID storage system, the method  
4       comprising:

5           creating an amount of storage necessary by providing RAID's on each subsystem  
6       that is associated with each component of a mirror set;

7           attaching the RAID's to a specific virtual disk for a mirror device; and

8           specifying a size for the virtual disk and mapping the size of the virtual disk  
9       directly to all components of the mirror set.

1           7.       A program storage device readable by a computer tangibly embodying one  
2       or more programs of instructions executable by the computer to perform a method for  
3       dynamically shrinking mirrored virtual disks in a RAID storage system, the method  
4       comprising:

5           specifying a size of a virtual disk and mapping the size of the virtual disk directly  
6       to all components of a mirror set;

7           detaching any RAID's that extend beyond the specified size of the virtual disk; and

8           truncating RAID's to free up any excess physical segments back into the RAID  
9       storage system.

1           8.       An apparatus for dynamically resizing mirrored virtual disks in a RAID  
2 storage system, comprising:  
3           a storage system interface for providing access to a storage system;  
4           host side interface for communicating with host devices; and  
5           a processor, coupled to the host side interface and the storage system interface, the  
6 processor being configured for receiving a request to dynamically resize mirrored virtual  
7 disks in a RAID storage system, manipulating RAID's in the RAID storage system to  
8 provide the desired resizing of the mirrored virtual disk and providing the resized  
9 mirrored virtual disks for operation.

1           9.       The apparatus of claim 8 wherein the processor is further configured for  
2 creating an amount of storage necessary by providing RAID's on each subsystem that is  
3 associated with each component of a mirror set, attaching the RAID's to a specific virtual  
4 disk for a mirror device and specifying a size for the virtual disk and mapping the size of  
5 the virtual disk directly to all components of the mirror set.

1           10.      The apparatus of claim 8 wherein the processor is further configured for  
2 specifying a size of a virtual disk and mapping the size of the virtual disk directly to all  
3 components of a mirror set, detaching any RAID's that extend beyond the specified size of  
4 the virtual disk and truncating RAID's to free up any excess physical segments back into  
5 the RAID storage system.

1           11.     A storage area network, comprising:  
2           a plurality of hosts;  
3           at least one access device, coupled to the plurality of hosts, for managing data  
4     input/output operations; and  
5           a storage platform, for providing networked storage to the at least one access  
6     device, the storage platform including a management device for dynamically resizing  
7     mirrored virtual disks in a RAID storage system, the management device further  
8     comprising:  
9           a storage system interface for providing access to a storage system;  
10          host side interface for communicating with host devices; and  
11          a processor, coupled to the host side interface and the storage system  
12     interface, the processor being configured for receiving a request to dynamically resize  
13     mirrored virtual disks in a RAID storage system, manipulating RAIDs in the RAID  
14     storage system to provide the desired resizing of the mirrored virtual disk and providing  
15     the resized mirrored virtual disks for operation.

1           12.     The storage area network of claim 11 wherein the processor is further  
2     configured for creating an amount of storage necessary by providing RAIDs on each  
3     subsystem that is associated with each component of a mirror set, attaching the RAIDs to  
4     a specific virtual disk for a mirror device and specifying a size for the virtual disk and  
5     mapping the size of the virtual disk directly to all components of the mirror set.

1           13.     The storage area network of claim 11 wherein the processor is further  
2 configured for specifying a size of a virtual disk and mapping the size of the virtual disk  
3 directly to all components of a mirror set, detaching any RAID's that extend beyond the  
4 specified size of the virtual disk and truncating RAID's to free up any excess physical  
5 segments back into the RAID storage system.

1           14.     An apparatus for dynamically resizing mirrored virtual disks in a RAID  
2 storage system, comprising:  
3           first means for providing an interface to a storage system;  
4           second means for providing communication with host devices; and  
5           means, coupled to the host side interface and the storage system interface, for  
6 receiving a request to dynamically resize mirrored virtual disks in a RAID storage system,  
7 manipulating RAID's in the RAID storage system to provide the desired resizing of the  
8 mirrored virtual disk and providing the resized mirrored virtual disks for operation.

1           15.     The apparatus of claim 14 wherein the means for manipulating further  
2 comprises means for creating an amount of storage necessary by providing RAID's on  
3 each subsystem that is associated with each component of a mirror set, attaching the  
4 RAID's to a specific virtual disk for a mirror device and specifying a size for the virtual  
5 disk and mapping the size of the virtual disk directly to all components of the mirror set.

1           16.     The apparatus of claim 14 wherein the means for manipulating further  
2     comprises means for specifying a size of a virtual disk and mapping the size of the virtual  
3     disk directly to all components of a mirror set, detaching any RAIDs that extend beyond  
4     the specified size of the virtual disk and truncating RAIDs to free up any excess physical  
5     segments back into the RAID storage system.